Problem I. Nightmare

Is this a programming contest?

Given a prime p and an $n \times n$ **non-zero** symmetric matrix G in which each element is an integer in $[0, p)$.

Little Cyan Fish asks you to find the **smallest** integer m satisfying:

- There exists n arrays of length m, $v_1, \ldots, v_n$, in which each element is an integer in $[0, p)$, such that for all $1 \le i, j \le n$, we have:

$$G_{i,j} = \left(\sum_{k=1}^{m} v_{i,k} v_{j,k} \right) \bmod p.$$

Input

The first line contains two integers n and p ($1 \le n \le 500$, $2 \le p \le 10^6$).

Each of the next n lines contains n integers. The j-th integer in the i-th line is $G_{i,j}$ ($0 \le G_{i,j} < p$, $G_{i,j} = G_{j,i}$ for all $1 \le i, j \le n$, $G \neq \mathbf{0}$).

It is guaranteed that p is a prime number, and that there exists at least one possible solution.

Output

The first line of the output contains an integer m, indicating the smallest possible integer m.

Each of the next n lines contains m integers. The j-th integer on the i-th line is $v_{i,j}$.

If there are multiple possible solutions, you may print any of them.

Examples

standard input	standard output
2 2 1 1 1 1	1 1 1
3 5 4 4 3 4 4 3 3 3 2	2 3 0 3 0 1 4